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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/537,032

11/14/2005

Frank Miller

10191/3696

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26646

7590

05/23/2008

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EXAMINER

GORMAN, DARREN W

ART UNIT

PAPER NUMBER

3752

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/537,032	<b>Applicant(s)</b> MILLER, FRANK	
	<b>Examiner</b> Darren W. Gorman	<b>Art Unit</b> 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2005 (preliminary amendment).
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 14-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/31/2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The IDS filed on May 31, 2005 is hereby acknowledged and has been placed of record. Please find attached a signed copy of the PTO 1449.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “metering chamber” into which the spray discharge opening of the nozzle body opens, as recited in claim 14; the “controller”, as recited in claim 21; and the metering conduit having “in an axial extent at least one reduced-wall thickness region”, as recited in claim 26, must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are further objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character not mentioned in the description: Reference number “17”, shown in Figure 3, is not found in the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are further objected to because the same reference characters have been used for modified versions of the same disclosed parts throughout the drawings. For example, the heating element and nozzle body shown in each of the different species of Figures 1-5 clearly exhibit different structural features or characteristics when comparing these elements to each

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other. However, these elements are designated only with reference numbers “4” and “7”, respectively. The aforementioned examples are not to be considered an exhaustive list of all such instances. Applicant should review the drawings in their entirety for compliance with MPEP § 608.02(e) and amend the specification to correspond with all changes made to the drawings.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), and amendment to the specification consistent with the corrected drawing sheets in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 14-20, 24, 26 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Krohn et al., USPN 5,947,091.

Krohn (see Figure 1) shows at least one metering device comprising a fuel injection valve (10), which meters fuel into a metering conduit (22); a nozzle body (33, 34, 35) adjoining the metering conduit, the nozzle body having at least one spray discharge opening (opened and closed by valve head member 32) which opens into a metering chamber (60); and at least one electrically operated heating element (23-Figure 1, or 23'-Figure 2, or 23''-Figure 3, and 43) with which heat can be delivered to the fuel, including at least one of a wire braid networked in mesh fashion, and a tubular hollow element. Krohn also shows an adapter (50) which joins the metering conduit and metering device in a hydraulically sealed and detachable fashion, the adapter including an air inlet (52; see column 4, lines 55-57) connected in the adapter to the metering conduit (via orifices 54). Krohn also shows at least one embodiment (see Figure 3) wherein at least one (centrally located heating element 23'') of the at least one heating element is immobilized using an attachment element (ceramic material in surrounding relation to centrally located heating element 23'') made of one of plastic, dip resin, or ceramic, and wherein at least one of the heating element and the attachment element is at least partially surrounded by ceramic (ceramic material in surrounding relation to the outer, concentrically located heating element 23''). Krohn further shows at least a portion of the metering conduit as having varying wall thickness, thus there is at least one "reduced" wall-thickness region. As to the preamble recitation, "for input into a chemical reformer in order to recover hydrogen or into a post-combustion device in order to generate heat", such recitations are not given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained

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description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

7. Claims 14, 17 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Grieve et al., US Patent Application Publication No. 2002/0108309.

Grieve (see Figure 2) shows at least one metering device (upstream region of fuel injector 124) which meters fuel into a metering conduit (inherent fuel conduit portion within fuel injector 124); a nozzle body (outlet end of fuel injector 124) adjoining the metering conduit, the nozzle body having at least one spray discharge opening (outlet end of fuel injector 124 inherently defines at least one spray discharge opening) which opens into a metering chamber (inside 120); and at least one electrically operated heating element with which heat can be delivered to the fuel, the heating element including a tubular hollow portion (125) of member (120), wherein the heating element is disposed after the spray discharge opening.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krohn et al.

Krohn shows all of the elements recited in claim 24, however Krohn is silent as to a specific fuel pressure operating range of the fuel injection valve. It should be noted that the opening pressure of the outlet valve (30) for the spray discharge orifice of Krohn is expressly disclosed as being between 2000-4000hPa (i.e. 2-4 bar: see column 4, lines 40-42). Thus, even though the fuel pressure operating range of fuel injection valve (10) is not expressly disclosed by Krohn, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a fuel injection valve that operates at fuel pressures below 10 bar, for the fuel injection valve of Krohn, since fuel injection valve operating pressures of above 10 bar in the device shown by Krohn would likely prematurely open the outlet valve without properly vaporizing the fuel as intended, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955).

10. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grieve et al.

Grieve shows all of the elements recited in claim 14, however Grieve is silent as to expressly regulating the heating element in terms of heat by a controller, such that the heating element is controlled based on operating parameters, such as a temperature in the metering chamber. It should be noted that the disclosure of Grieve expressly discusses the importance of maintaining a particular temperature range within the metering chamber (inside 120) (see paragraph [0038]). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include some kind of control system (i.e. a controller) with the apparatus shown by Grieve, in order to monitor the operating parameters of the system



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including, in particular, the temperature within the metering chamber, such that the parameters of the system, such as the temperature within the metering chamber, are maintained within an optimal range.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darren W. Gorman whose telephone number is 571-272-4901.

The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on 571-272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Darren W Gorman/  
Primary Examiner, Art Unit 3752

/D. W. G./  
Primary Examiner, Art Unit 3752